

3. Subbasin Assessment – Pollutant Source Inventory

There are three categories of potential pollution inputs to the waters of the Goose Creek Subbasin: point sources, nonpoint sources, and background.

There is one small point source in the basin. The point source is a small fish hatchery, which discharges to Trapper Creek. The fish hatchery is small enough to not require a NPDES permit and hence will be treated as a nonpoint source until such time that it is permitted. *As of the summer of 2003 the fish hatchery was no longer operational. However the fish hatchery discussions will be retained in this document so that the SBA remains valid if the hatchery should again begin fish production.*

Confined animal feeding operations (for dairy and meat production), septic systems, and activities such as farming and grazing have the potential to produce pollutants in the watershed. Total surface discharges from these activities are minimal (with the exception of the growing season return flows from irrigated agriculture) and have relatively minor impacts in the streams. It is unknown at this time how many sources within the subbasin land-apply their waste. Although the total discharges are minimal, the high concentrations of pollutants can make the loadings significant, particularly at lower flows. The region is arid, and most surface flow is intercepted and consumed in the agricultural process, evapotranspired, or infiltrated to the subsurface.

The contributions of the nonpoint source impacts; however, are often integrated from the many entry sites into the larger discrete flows of the tributaries and drains. This integration often hides the magnitude of the impacts of single activities or sources. For example, home sewer systems and animal feedlots are legally forbidden to produce direct surface discharges. However, manure from the latter is eventually spread on agricultural lands as fertilizer and becomes inseparable from other nutrient production that results from application of chemical fertilizer in the agricultural process. The great majority of lands used exclusively for grazing in this arid area produce no surface runoff at all, although rangeland comprise approximately 67 percent of the land use of the subbasin. Where grazing (post-harvest) occurs in combination with agriculture, the effects of manure and trampling of riparian areas may be inseparable from, and concurrent with, the effects of fertilizer application and plowing up to the stream sides.

Natural erosive processes by the streams in the subbasin include scouring stream banks and beds, overland sediment transport, and mass wasting (earth movement down-gradient). The natural introduction of nutrients and sediment into the watershed includes nutrients and sediment transported by precipitation, wind, and ground water (in the case of nutrients). Most of these natural processes are also, to some respect, enhanced or accelerated by human alterations of the landscape (e.g., grazing and farming operations that effect riparian growth and streamside cover), often making specific attribution of pollutant production difficult.

3.1 Sources of Pollutants of Concern

The following sections will discuss the point sources and major nonpoint sources of the Goose Creek Subbasin. These sources or land uses will serve as the basis for the load allocations in the required TMDLs.

Point Sources

As stated previously, there is one known point source within the subbasin. The source is a small fish hatchery. Typical pollutants from this type of operation include TSS, nutrients, and BOD. The hatchery is located midway through the listed segment of Trapper Creek. In addition to acting as a point source, the hatchery may also serve as a sediment removal system. The raceways are periodically cleaned and any accumulated sediment from upstream sources is removed from the ponds and quiescent zones. Currently the hatchery has too low a production rate to fall under the general aquaculture NPDES permit, and therefore is considered a nonpoint source.

Nonpoint Sources

Nonpoint pollution in the Goose Creek Subbasin has not been clearly identified. Rather it is assumed to be coming from the different land uses at equal rates. Therefore, any load allocations can be made based on the percentage of differing land uses within a watershed (See Figure 18 for the location of watersheds within the Goose Creek Subbasin). In some cases, the watershed area contains several water quality limited water bodies. In other cases, the water quality limited water body is not the mainstem of the watershed. In these instances, it was more appropriate to determine the land use breakdown from a set buffer or critical area. In this manner, the most probably areas contributing nonpoint sources pollution to the stream are captured rather than large tracts of land uses that may not influence the particular listed stream or segment. In other TMDLs, this buffer zone was set at 1.6 km on either side of the stream in question. This buffer zone would incorporate those areas most likely to influence the water quality of the particular stream. The following table (Table 28) describes the land use breakdown of each watershed or buffer zone that contains a water quality limited water body within the Goose Creek Subbasin.

Table 28. Percent land use for load allocation purposes.

Water body	Percent Forest	Percent Range	Percent Urban	Percent Irrigated Sprinkler	Percent Irrigated Gravity
Goose Creek	70.1	0.0	1.7	0.3	27.9
Trapper Creek	47.8	52.2	0.0	0.0	0.0
Birch Creek	5.1	72.5	3.5	18.9	0.0
Cold Creek	75.3	22.5	2.2	0.0	0.0
Blue Hill Creek	68.3	24.9	0.0	0.0	6.8
Beaverdam Creek	53.1	37.4	0.0	0.0	9.5
Big Cottonwood Creek	19.9	64.2	0.0	7.7	8.2
Emery Creek	85.1	5.4	0.0	0.8	8.7
Little Cottonwood Creek	40.4	42.1	0.7	16.8	0.0
Left Hand Fork Beaverdam Creek	29.0	71.0	0.0	0.0	0.0
Goose Creek Reservoir	See Goose Creek and Trapper Creek distributions.				
Mill Creek	1.4	48.9	1.9	42.7	5.1